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ZOOLOGY.—*Fresh-water Ostracoda from Texas and Mexico*. WILLIS L. TRESSLER, U. S. Navy Hydrographic Office.

The fresh-water Ostracoda of Texas have received very little attention and as a result are practically unknown. Many years ago William Baird (1862) described *Chlamydotheca texasiensis* from some material sent him from Texas, and to the best of my knowledge this remains the sole valid ostracod record for the State. The present paper reports on 13 ostracod species new to Texas, 6 of which appear to be new species. A number of species of fresh-water Ostracoda have been reported from Mexico commencing with de Saussure who described *Chlamydotheca azteca* from Mexico in 1858 (Saussure, 1858), down to one of the most recent workers, Dr. Rioja, who has added several new species to the peculiar genus *Entocythere*, all of whose members are parasitic or commensal on the gills of fresh-water crayfish (Rioja, 1940a, 1940b, 1942, 1944). The species previously known from Mexico proper include *Physocypria dentifera* (Sharpe), *P. denticulata* (Daday), *Cyprinotus pellucidus* Sharpe, *Eucypris fuscatus* (Jurine), *E. virens* (Jurine), *Chlamydotheca azteca* (Saussure), *C. arcuata* (Sars), *C. mexicana* Sharpe, *Cypricerus affinis* (Fischer), *Potamocypris smaragdina* (Vavra), *Entocythere heterodonta* Rioja, *E. sinuosa* Rioja, *E. claytonhoffi* Rioja, *E. dobbinae* Rioja, and *E. mexicana* Rioja. The present paper adds four species to the record and of these, three species appear to be new to science.

Three locations in east Texas produced four species; five lakes in west Texas, from which ecological factors are known, produced eight species; six small pools also in west Texas had six species of Ostracoda; one location in south Texas had one species; and two lakes which were visited in Mexico,

yielded four species. A tabulation of the species collected in each locality is shown in Table 1.

There are now over 200 known species of fresh-water Ostracoda in North America (Tressler, in press), and many of these are undoubtedly present in Texas and adjoining regions of Mexico. Future workers in these regions, have accordingly, an almost virgin territory in which to work as far as the fresh-water Ostracoda are concerned.

The material for the present report was collected by Dr. Edward S. Deevey, of Yale University, while an instructor at the Rice Institute, during trips in the western part of Texas and parts of Mexico in 1940 and 1941. Some material is also included which was sent by Miss Marcile Patterson, of the Texas Game, Fish, and Oyster Commission, and which contained additional specimens of three species collected by Dr. Deevey.

The slides of the dissected specimens from which the camera lucida drawings were made, have been deposited in the U. S. National Museum as type specimens.

Ecological data for some of the regions have been very kindly furnished by Dr. Deevey. A summary of these data, together with the species of Ostracoda found in each locality are presented in Table 1. Because of the incompleteness of the biological and ecological data, no broad conclusions can be drawn as to the ecological distribution of the species collected. It is to be noted, however, that the cosmopolitan species *Cypridopsis vidua* is to be found under a wide variety of conditions running from strictly fresh-water to the highly saline waters of salt flats. The brackish-water species, *Cyprinotus sa-*

*linus*, as its name indicates, is always found in saline waters.

Suborder PODOCOPA

Family Cypridae: Subfamily Candocyprinae

Genus *Cypria* Zenker, 1854

Valves compressed, very thin when viewed from above. Margins of valves smooth. Color of valves usually yellow to brown and spotted. Natatory setae of second antenna well developed and extending considerably beyond tips of terminal claws. Terminal segment of third thoracic leg short and with two forwardly directed setae and one reflexed seta. Furca moderately developed, dorsal seta sometimes rudimentary or absent.

*Cypria lacustris* Sars, 1891

Fig. 1

*Cypria lacustris* G. O. Sars, Forh. Selsk. Christiania 1890 (1): 64. 1891.

*Cypria lacustris* G. S. Brady and A. M. Norman, Trans. Roy. Dublin Soc. (2) 5: 719. 1896.

*Cypria lacustris* G. O. Sars, Crust. Norway, IX: Ostracoda: 98. 1928.

*Specific characters*.—Female: Shell suboval in shape, greatest height slightly greater than two-thirds the length. Dorsal margin evenly curved, ventral margin slightly sinuated, both extremities evenly rounded. From above, narrow, with greatest width about one third the length. Valves very clear, with smooth and polished surfaces, pigment spots entirely lacking, broad hyaline borders anteriorly and posteriorly. Caudal furca slender and slightly curved; distal claw amounting to about one-half the length of the ramus. Length 0.60 mm, height 0.42 mm. Color, transparent white with a yellowish tinge.

Male: Smaller than the female, posterior portion of shell broader. Right prehensile palp abruptly expanded at the end; left palp narrowed at outer end.

*Occurrence*.—One female was identified from collections made in Fern Bog, Big Thicket, Polk County, Tex., on May 12, 1940.

*Distribution*.—Originally reported from Sweden, this species has been found in the Northwest Territories and in Michigan.

Genus *Candona* Baird, 1842

Shells of a whitish color with smooth valves which are sometimes covered with scattered puncta. Eye poorly developed or absent. Terminal segment of maxillary palp broader than

long. Third thoracic leg four or five-segmented depending upon whether penultimate segment is divided or not; terminal segment short with three unequal setae. Furca well developed. Ejaculatory duct with five whorls of spines.

*Candona intermedia* Furtos, 1933

Figs. 2, 3

*Candona intermedia* N. C. Furtos, Ohio Biol. Surv. 5 (6): 474. 1933.

*Specific characters*.—Female: Seen from the side, elongated, height about one-half the length, highest in posterior third. Posterior extremity with a sharp posteroventral angle. Ventral margin slightly sinuated in the middle, convex anteriorly, slightly sinuated anterior to the posteroventral angle. Seen from above, elliptical, width less than one-half length, left valve projects beyond right at both extremities. Surface of valves sparsely hairy. Medial-distal seta of penultimate segment of mandibular palp plumose. Penultimate segment of third thoracic leg divided. Furca slender, sixteen times longer than narrowest width; claws coarsely denticulated. Length 1.7 mm, height 0.92 mm, width 0.73 mm.

Male: Somewhat longer than female; posterior extremity lacks the angle. Right prehensile palp elongated, left palp shorter, stouter. Furca straight, seventeen times longer than narrowest width.

*Remarks*.—This species may be distinguished from *Candona caudata* Kaufmann by its greater size and the plumose mandibular seta, which is smooth in *C. caudata*.

*Occurrence*.—Two immature specimens were taken from Balmorea Lake, Reeves County, Tex., at a depth of 4.5 meters on June 21, 1940, and one female was sent from an unknown location in Texas by Miss Marcile Patterson.

*Distribution*.—In Ohio, where this species was originally described, it was found in cold, clear waters during May and June.

*Candona patzcuaro*, n. sp.

Figs. 4-8

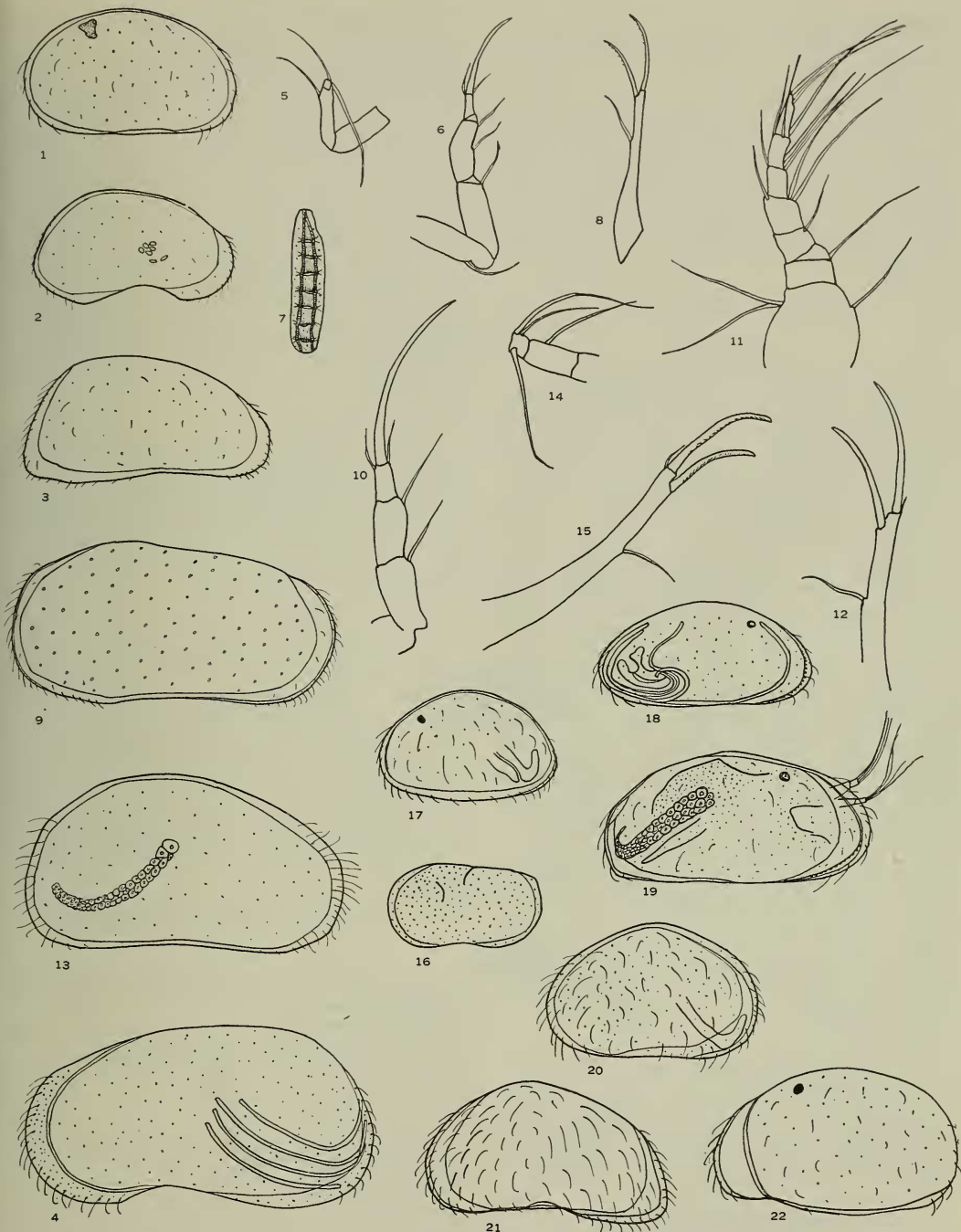
*Specific characters*.—Male: Seen from the side, elongated, height slightly greater than one-half the length; both ends rounded, the posterior more evenly and broadly. A distinct indentation at the anterodorsal margin and a sharp angle at the anteroventral margin are present. Dorsal margin rounded; ventral margin deeply indented

posterior to the anteroventral angle. Valves smooth and sparsely hairy. Color whitish. Second thoracic leg with a rather short terminal claw. Third thoracic leg with two nearly equal terminal setae and one longer, reflexed seta; penultimate segment indented but not distinctly divided.

Furcal ramus twenty times length of narrowest width; terminal claw about one-half the length of ramus; subterminal claw seven-tenths length of terminal claw; both claws finely toothed in their distal halves; terminal seta absent in the specimens observed; dorsal seta six-sevenths

TABLE 1.—ECOLOGICAL DATA ON FRESH-WATER OSTROCODA FROM TEXAS AND MEXICO

Locality and Species	Cl mg/l	SiO <sub>2</sub> mg/l	Total P. mg/m <sup>3</sup>	Total N mg/l	HCO <sub>3</sub> mg/l	SO <sub>4</sub> mg/l
<i>East Texas</i>						
FERN BOG, BIG THICKET <i>Herpetocypris pattersoni</i> <i>Cypria lacustris</i>						
POOL NEAR SARATOGA <i>Limnocythere sancti-patricii</i>						
SAN JACINTO RIVER BOTTOM <i>Cypridopsis potamis</i>						
<i>West Texas</i>						
BALMORHEA LAKE <i>Candona intermedia</i> <i>Ptyocypris buplicata</i> <i>Cypridopsis vidua</i>	560	16.3	85	0.484	158.6	555
PHANTOM LAKE <i>Chlamydotheca texasiensis</i> <i>Cypridopsis phantomensis</i> <i>Cypridopsis musquizensis</i> <i>Cypridopsis toyensis</i>	693	15.7	6	4.484	282.2	625
FORT STOCKTON LAKE <i>Cypridopsis vidua</i>	378	23.6	45	0.632	153.7	968
FINDLAY SPRING <i>Cyprinotus dentatus</i>	5.8	12.6	65	0.931	156.1	61.6
TOYAH LAKE <i>Cypridopsis toyensis</i> <i>Cypridopsis musquizensis</i>	485	11.3	46.5	0.702	54.5	1540
FERN CANYON <i>Herpetocypris pattersoni</i>	24.5	47.6	148.0	1.249	90.1	1
LIMPIA CREEK <i>Herpetocypris pattersoni</i>						
MUSQUIZ CREEK <i>Herpetocypris pattersoni</i> <i>Cypridopsis musquizensis</i>						
BELL CANYON <i>Cypridopsis vidua</i> <i>Candonocypris deveyi</i>						
SALT FLAT DITCH <i>Cypridopsis vidua</i> <i>Potamocypris smaragdina</i>						
TANK, SALT BASIN <i>Potamocypris smaragdina</i> <i>Cypridopsis vidua</i> <i>Cyprinotus salinus</i>						
BALMORHEA IRRIGATION DITCH <i>Cypridopsis vidua</i>						
<i>South Texas</i>						
LAKE NO. 3, KLEEBERG COUNTY <i>Candonocypris deveyi</i>	21.00				53.5	
<i>Mexico</i>						
LAGO DE PATZCUARO <i>Candona patzcuaro</i> <i>Candona michoa</i>	21.3	14	19.5	(organic) 0.586	458	0.2
PRESA DE HIPOLITO <i>Cypridopsis vidua</i> <i>Candona hipolitensis</i>	17.05	10	90.0	0.705	86.8	24.0



FIGS. 1-22.—1, *Cypria lacustris* Sars: Lateral view of left valve, female. 2-3, *Candona intermedia* Furtos: 2, lateral view of right valve, male; 3, lateral view of right valve, female. 4-8, *Candona patzcuaro*, n. sp.: 4, lateral view of left valve, male; 5, third thoracic leg, male; 6, second thoracic leg, male; 7, ejaculatory duct, male; 8, furca, male. 9-12, *Candona michoa*, n. sp.: 9, lateral view of left valve, female; 10, second thoracic leg, female; 11, first antenna, female; 12, furca, female. 13-15, *Candona hipolitensis*, n. sp.: 13, lateral view of right valve, female; 14, terminal portion of third thoracic leg, female; 15, furca, female. 16, *Ptyocypris biplicata* Koch, lateral view of left valve, female. 17, *Cyprinotus salinus* (Brady), lateral view of left valve, female. 18-19, *Cyprinotus dentatus* Sharpe, 18, lateral view of right valve, male; 19, lateral view of right valve, female. 20, *Cypridopsis vidua* (O. F. Müller), lateral view of left valve, female. 21, *Potamocypris smaragdina* (Vavra), lateral view of left valve, female. 22, *Chlamydotheca texasiensis* (Baird), lateral view of left valve, female.

length of subterminal claw. Ejaculatory duct with seven whorls of spines. Length 1.30 mm, height 0.68 mm.

Female: Unknown.

*Occurrence*.—Two males were collected from Lago de Patzcuaro in the state of Michoacán, Mexico, by Dr. Deevey on July 10, 1941. The specimens were secured with a dredge at 4 meters depth. Male holotype, U. S. Nat. Mus. No. 96047.

***Candona michoa*, n. sp.**

Figs. 9-12

*Specific characters*.—Female: Seen from the side, elongated; height equal to half the length, highest in posterior third. Both extremities rounded, the anterior more evenly so than the posterior. Anterodorsal and posterodorsal margins with indentations, the anterior indentation more sharply defined but of less extent. Dorsal margin flattened and gently sloping upward posteriorly toward the highest point; ventral margin slightly sinuated and concave. Valves smooth and sparsely hairy. Color white. Antennae typical of the genus. Second thoracic leg with slender terminal claw of medium length. Third thoracic leg with the longer of the two terminal setae equal in length to that of the reflexed seta; shorter terminal seta two-thirds length of longer; penultimate segment indistinctly subdivided. Furcal ramus 16 times as long as narrowest width; both claws smooth or finely haired; terminal claw one-half length of furcal ramus; subterminal claw three-fourths length of terminal claw; terminal seta one-eighth length of terminal claw; dorsal seta two-thirds length of subterminal claw. Length 1.16 mm, height 0.58 mm.

Male: Unknown.

*Occurrence*.—Two females were collected by Dr. Deevey from Lago de Patzcuaro in the state of Michoacán on July 10, 1941. The specimens were collected with a dredge at 4 meters depth. Female holotype, U. S. Nat. Mus. No. 96048.

***Candona hipolitensis*, n. sp.**

Figs. 13-15

*Specific characters*.—Female: Seen from the side, elongate, height definitely greater than one-half length. Both ends rounded, the anterior more evenly than the posterior. Posterior extremity with a rounded angle three-fourths the distance to the dorsal margin. Dorsal margin

broadly rounded; greatest height in the middle; ventral margin slightly concave. Surface of valves smooth and sparsely hairy. Color whitish. Second thoracic leg with terminal claw well developed and equal in length to the length of the last three segments. Third thoracic leg with three long, unequal setae; penultimate segment indistinctly subdivided. Furcal ramus sixteen times as long as narrowest width; both claws well toothed in distal three-fourths; terminal claw less than one-half the length of the ramus; subterminal claw six-sevenths the length of terminal claw; dorsal seta four-sevenths length of subterminal claw. Length 1.16 mm, height 0.62 mm.

Male: Unknown.

*Occurrence*.—One female was collected by Dr. Deevey in Presa de Hipolito in the state of Coahuila, Mexico, on June 19, 1940. The specimen was secured at a depth of one and one-half meters by means of the Ekman dredge. Female holotype, U. S. Nat. Mus. No. 96049.

Subfamily Ilyocyprinae

Genus ***Ilyocypris*** Brady and Norman, 1889

Shells oblong with one or more transverse median depressions; surface pitted and often with tubercles or protuberances. Terminal segment of third thoracic leg with three, long, simple setae, one of which may be reflexed. Furca with two long, equal claws; dorsal seta attached near middle of ramus and well developed.

***Ilyocypris biphlicata*** (Koch, 1838)

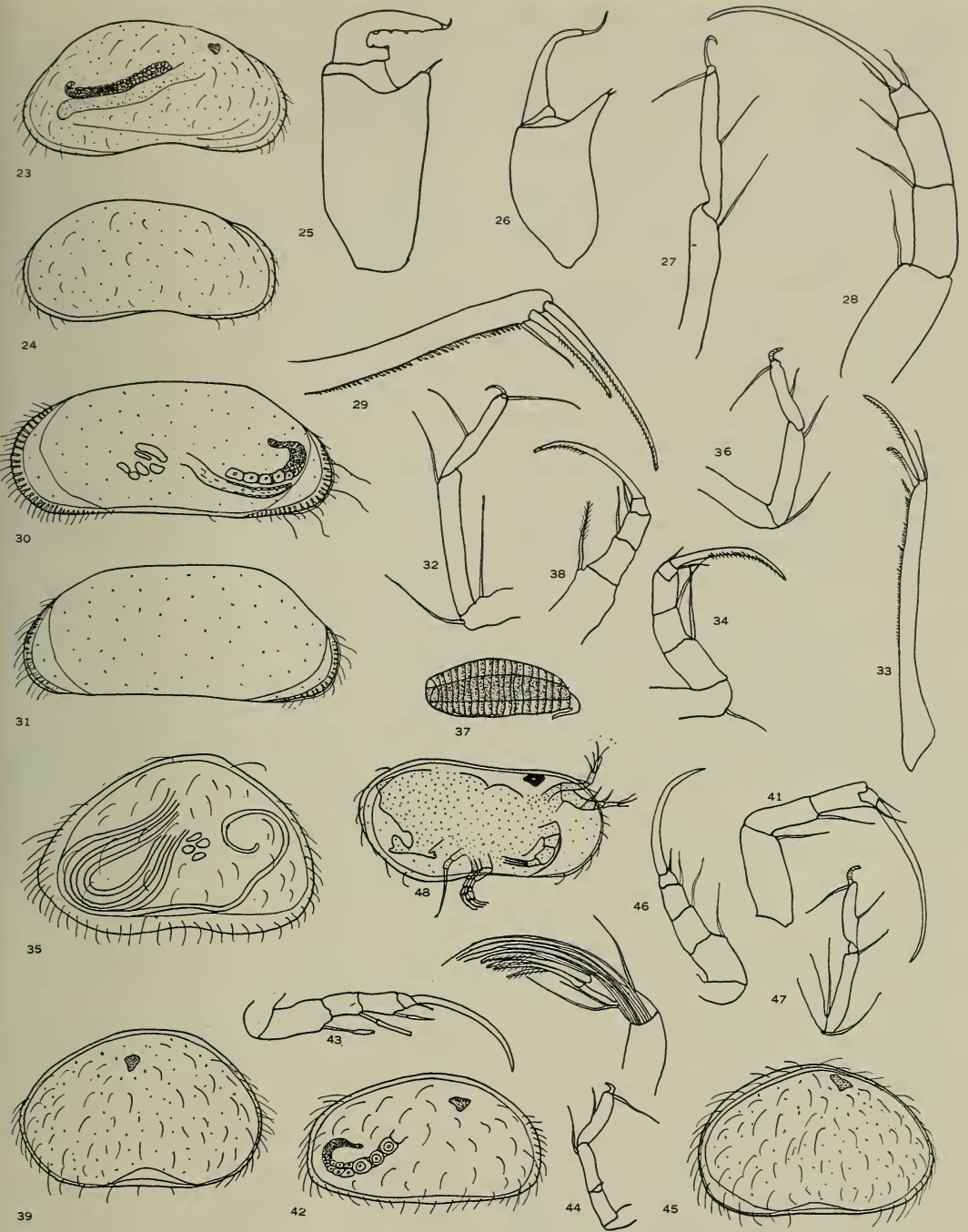
Fig. 16

*Cypris biphlicata* C. L. Koch, Deutschlands Crust. **21** (16). 1838.

*Ilyocypris biphlicata* T. Scott and R. Duthie, Rep. Fish. Board. Scotland. **15**: 330. 1897.

*Ilyocypris biphlicata* G. O. Sars, Crust. Norway, IX: Ostracoda: 106. 1928.

*Specific characters*.—Female: Shell oval quadrangular in shape rather compressed seen from the side. Somewhat higher in front than behind and highest near the eye; height slightly greater than one-half the length. Dorsal margin almost straight; ventral margin deeply sinuated in middle. Two vertical folds are very conspicuous features in the front part of the valves. No lateral protuberances. Anterior and posterior valve edges denticulated, those of the anterior region being more crowded. Color, opaque, whitish gray. Surface of valves granular with



FIGS. 23-48.—23-29, *Candonocypris deeveyi*, n. sp.: 23, Lateral view of right valve, female; 24, lateral view of right valve, male; 25, 26, prehensile palps, male; 27, third thoracic leg, female; 28, second thoracic leg, female; 29, furca, male. 30-34, *Herpetocypris pattersoni*, n. sp.: 30, Lateral view of left valve, female; 31, lateral view of left valve, male; 32, third thoracic leg, female; 33, furca, female; 34, second thoracic leg, female. 35-38, *Cypridopsis phantomensis*, n. sp.: 35, Lateral view of right valve, male; 36, third thoracic leg, male; 37, ejaculatory duct, male; 38, second thoracic leg, male. 39-41, *Cypridopsis musquizenis*, n. sp.: 39, Lateral view of left valve, male; 40, second antenna, male; 41, second thoracic leg, male. 42-44, *Cypridopsis toyensis*, n. sp.: 42, Lateral view of right valve, female; 43, second thoracic leg, female; 44, third thoracic leg, female. 45-47, *Cypridopsis potamis*, n. sp.: 45, lateral view of right valve, female; 46, second thoracic leg, female; 47, third thoracic leg, female. 48, *Limnocythere sanctipatrici* Brady and Robertson, lateral view of entire animal in left valve, male.

many small, rounded pits. Extremities with dense, fine hairs. Natatory setae of second antenna extend considerably beyond tips of terminal claws. Caudal furca slightly curved and gradually attenuated; terminal claws rather slender; the distal claw being about one-half the length of the ramus. Length 1.10 mm.

Male: Smaller than female but otherwise of similar shape. Ejaculatory tubes with eighteen whorls of spines.

*Remarks.*—Although combined by some authors with *Ilyocypris gibba* (Ramdohr), the present form may be distinguished easily by the more prominent lateral folds and the absence of lateral protuberances.

*Occurrence:* Empty shells of this species were collected from Balmorhea Lake, Reeves County, Tex. in water 4.5 meters deep on June 21, 1940.

*Distribution.*—This species is rather widely known throughout Europe and from Algeria. It is reported for the first time in North America.

#### Subfamily Cyprinae

#### Genus *Cyprinotus* Brady, 1885

More or less elongated shells; margin of right valve commonly tuberculated. Natatory setae of second antenna well developed. Third maxillary process with two spines which may be either smooth or toothed. Furca moderately developed.

#### *Cyprinotus salinus* (Brady 1862)

Fig. 17

*Cypris strigata* G. S. Brady, *Intell. Observ.* 1: 452. 1862.

*Cypris salina* G. S. Brady, *Trans. Linn. Soc. London.* 26: 368. 1868.

*Cyprinotus salina* G. O. Sars, *Forh. Selsk. Christiania.* 1890 (1): 56. 1891.

*Cyprinotus salinus* G. W. Müller, *Das Tierreich,* 31: 165. 1912.

*Cyprinotus salinus* G. O. Sars, *Crust. Norway,* IX: Ostracoda: 122. 1928.

*Specific characters.*—Female: Shell broadly oval when seen from the side. Greatest height in middle and equal to two-thirds the length. Dorsal margin broadly arched; ventral margin somewhat sinuated; posterior extremity conspicuously produced into a rounded expansion. Seen from above, width slightly less than one-half the length. Valves very unequal, left valve overlaps the right. Denticles of right valve small and crowded. Natatory setae of second antenna extend to tips of terminal claws. Caudal rami

small, straight, and gradually attenuated toward their ends. Color of shell a pale yellow with a number of conspicuous dark-brown, bandlike patches. Surface of valves smooth with fine hairs. Length 1.25 mm.

Male: Unknown.

*Occurrence.*—Five females were found in a collection made from a tank in a salt basin in Hudspeth County, Tex., on June 10, 1940.

*Distribution.*—This species has been reported from Sweden, the British Isles, Pomerania, France, and Norway; it is noted for the first time from North America.

#### *Cyprinotus dentatus* (Sharpe, 1910)

Figs. 18, 19

*Cyprinotus dentata* R. W. Sharpe, *Proc. U. S. Nat. Mus.* 38: 336. 1910.

*Cyprinotus dentata* R. W. Sharpe, *Ostracoda in Ward and Whipple:* 816. 1918.

*Cyprinotus dentatus* C. C. Hoff, *Journ. Tennessee Acad. Sci.* 13 (1): 102. 1943.

*Specific characters.*—Female; Seen from the side, shell margins nearly parallel; posterior extremity more pointed than anterior. Right valve somewhat smaller than left and lined along its ventral margin, except in the middle, with some 60 fine denticles, closely spaced. Spines of maxillary process strongly developed and toothed. Furca about 16 times longer than narrowest width of ramus; slightly curved; claws nearly smooth. Surface of valves smooth with no markings. Color yellowish, transparent. Length 1.3–1.4 mm, height 0.5–0.65 mm, width 0.5–0.58 mm.

Male: Smaller than female. Maxillary palps stout and decidedly hooked. Ejaculatory duct with 26 whorls of spines.

*Occurrence.*—Twelve specimens, both males and females, were found in collections made in Finlay Springs, Hudspeth County, Tex., on June 23, 1940. Also, two females were taken from Phantom Lake in the Davis Mountains, Tex., on June 23, 1940.

*Distribution.*—Nebraska, Tennessee (Reelfoot Lake).

#### Genus *Candonocypris* Sars, 1895

Elongated shells of large size with valve margins either smooth or serrated. Natatory setae of second antenna not very well developed. two maxillary spines well toothed. Furca well developed; dorsal margin generally denticulated.

*Candonocypris deeveyi*, n. sp.

Figs. 23-29

*Specific characters*.—Female: Seen from the side, elongated oval in shape; height equal to half the length; highest in posterior third. Posterior end more broadly rounded than anterior with a concavity near the upper two-thirds of the posterior margin. Anterior end with a distinct furrow on the anterodorsal margin. Dorsal margin rounded; ventral margin sinuated and concave in the middle. Valves smooth with a few scattered, long hairs; edges of valves smooth. Eye prominent. Color of preserved specimen brown. Second thoracic leg with a slender terminal claw equal in length to the combined length of the last three segments. Third thoracic leg with a slender terminal claw and one short, reflexed seta; penultimate segment undivided. Furca well developed; subterminal claw slightly longer than half the length of terminal claw; both claws toothed on distal three-fourths; dorsal seta slightly longer than half the length of subterminal claw; terminal seta equal in length to dorsal seta or one-fourth length of terminal claw; dorsal margin of ramus heavily toothed. Length 3.26 mm, height 1.63 mm.

Male: Seen from the side, elongate and not so high as the female; greatest height in posterior quarter and equal to about three-sevenths of the length. Posterodorsal concavity indistinct; anterior dorsal furrow prominent. Ventral margin slightly concave. Length 3.26 mm, height 1.47 mm.

*Occurrence*: Four females were collected from Lake No. 3 in Kleiberg County, Tex., by Dr. Deevey on June 30, 1941. Several male specimens were sent in by Miss Patterson from an unknown location in Texas, possibly from Dalhart in Dallam County, north Texas, where they were collected in the spring of 1940. Female holotype, U. S. Nat. Mus. No. 96050; male paratype, U. S. Nat. Mus. No. 96051.

Genus *Herpetocypris* Brady and Norman, 1889

Elongated shells with scattered puncta between which are smaller puncta. Maxillary spines well developed; terminal segment of maxillary palp widened distally. Furca strongly developed terminal claw appreciably shorter than one-half the length of the ramus.

*Herpetocypris pattersoni*, n. sp.

Figs. 30-34

*Specific characters*.—Female: Seen from the

side, elongated, greatest height in posterior third of shell and appreciably less than one-half the length of the shell. Dorsal margin flattened and gently sloping toward anterior end. Ventral margin slightly sinuated. Anterior extremity broadly and evenly rounded; posterior extremity narrowly rounded and somewhat produced in the ventral half; dorsal half sloping steeply posteriorly. Pore canals prominent in anterior margin. Shell sparsely hairy with a few long, stout hairs at posterior extremity. Left valve larger than right. Natatory setae of second antenna do not reach to tips of terminal claws. Second thoracic leg with heavy, well developed terminal claw which is toothed along its distal two-thirds. Third thoracic leg with one short claw and a long, backwardly directed seta. Furca with ramus 16 times longer than narrowest width; five groups of hairs along dorsal margin; posterior claw barely one-half length of anterior claw; terminal bristle slightly longer than one-half posterior claw. Length 2.20 mm, height 0.90 mm.

Male: Similar in shape and in structure of appendages to female but slightly smaller. Length 2.12 mm, height 0.73 mm.

*Occurrence*. Four females were collected by Dr. Deevey from the upper pool in Fern Canyon, Davis Mountains, Tex., on June 19, 1940. Two females were also taken in Limpia Creek 5 miles below Fort Davis, Tex., on the same date, and 10 females were found in Musquiz Creek in the Davis Mountains, Tex., on June 20, 1940. Several specimens, all males, were sent to Miss Patterson by a collector from an unknown location in Texas. Female holotype, U. S. Nat. Mus. No. 96052; male paratype, U. S. Nat. Mus. No. 96053.

Genus *Chlamydotheca* Saussure 1858

Large forms with flangelike projections at the extremities of valves. Natatory setae of second antenna fairly well developed. Third maxillary process with one toothed and two smooth spines. Second segment of third thoracic leg with two prominent setae on inner distal border. Furca well developed; dorsal margin denticulated.

*Chlamydotheca texasiensis* (Baird, 1862)

Fig. 22

*Cypris texasiensis* W. Baird, Ann. Mag. Nat. Hist. (3) 10: 4. 1862.

*Chlamydotheca texasiensis* N. C. Furtos, Carnegie Inst. Washington Publ. 457: 99. 1936.



*Specific characters.*—Female: Seen from the side, dorsal margin boldly arched; a prominent flange present at anterior end. Ventral margin nearly straight except for a blunt incisure marking off the anterior flange. Seen from above, very tumid, with greatest width amounting to about eight-fifteenths the length. Right valve projects slightly beyond left at anterior end. Posterior end narrowly rounded, anterior end rather sharply pointed. Surface of valves smooth with scattered puncta bearing delicate hairs. Two very prominent hairs on posterior extremity. Color light, with six radially arranged bands originating from a circular band around the muscle scars. Natatory setae of second antenna do not reach to tips of terminal claws. Furca very slightly curved and nineteen times as long as narrowest width of ramus; dorsal margin faintly pectinate. Length 3.30 mm, height 2.10 mm.

Male: Unknown.

*Remarks.*—Although somewhat similar to *C. speciosa* and *C. arcuata*, the present species may be distinguished from these forms by the much more elongated shape of *C. speciosa* and by the fact that *C. arcuata* is distinctly pointed at both extremities when viewed from above.

*Occurrence.*—Two females were collected from Phantom Lake in the Davis Mountains, Tex., on June 23, 1940, by Dr. Deevey.

*Distribution.* Texas, Ohio, Yucatán, and Louisiana.

#### Genus *Cypridopsis* Brady, 1867

Small, tumid forms, very high when viewed from the side; left valve usually larger than the right. Natatory setae of second antenna extend considerably beyond tips of terminal claws. Maxillary palps are not broadened distally. Furca rudimentary with a short base and flagellum.

#### *Cypridopsis vidua* (O. F. Müller, 1776)

*Cypris vidua* O. F. Müller, Zool. Dan. Prodr.: 199. 1776.

*Cypridopsis vidua* G. S. Brady, Intell. Observ. 12: 117. 1867.

*Pionocypris vidua* G. O. Sars, Crust. Norway, IX: Ostracoda: 135. 1928.

*Cypridopsis vidua obesa* N. C. Furtos, Ohio Biol. Surv. 5 (6): 430. 1933.

*Cypridopsis vidua* C. C. Hoff, Illinois Biol. Monogr. 19 (1-2): 151. 1942.

*Specific characters.*—Female: Seen from the side, short, plump forms with height equal to

two-thirds the length and with broadly rounded extremities. Boldly arched dorsal margin; a distinct angle is formed slightly behind the middle. Seen from above, very broad and rounded; width about two-thirds the length. Surface of valves pitted and hairy. Color light green with three more or less prominent dark green or brown bands extending laterally from a single dorsal band. In some variations these bands are very indistinct or entirely lacking. Natatory setae of second antenna extend slightly beyond tips of terminal claws. Flagellum of furca two and one-half times longer than the length of the base; dorsal seta present. Length 0.60–0.75 mm.

Male: Unknown.

*Remarks.*—This is the most common and most widely distributed freshwater ostracod and has been reported from nearly all regions of North America from which collections of Ostracoda have been made. It is the common form which develops in aquaria. The wide variation in color patterns or their absence has caused the formation of new species which are undoubtedly simply color varieties of *Cypridopsis vidua*.

*Occurrence.*—This species was found in seven localities in Texas and one in Mexico as follows: 7 females from Fort Stockton Lake, Pecos County Tex., June 2, 1941; 12 females from Bell Canyon, Tex. (no date); 1 female from Salt Flat ditch, Hudspeth County, Tex., June 12, 1940; 12 females from tank, Salt Basin, Hudspeth County, Tex., June 10, 1940; 4 females from Balmorhea Lake, Reeves County, Tex., June 20, 1940; 9 females from Balmorhea irrigation ditch, Reeves County, Tex., June 20, 1940; and 9 females from Presa de Hipolito, Mexico.

*Distribution.*—Widely distributed in North America, Europe, Siberia, China, South America, Azores.

#### *Cypridopsis phantomensis*, n. sp.

Figs. 35–38

*Specific characters.*—Male: Seen from the side, dorsal margin boldly arched; height two-thirds the length and highest in the middle. Ventral margin sinuated in the middle. Both extremities rounded, anterior extremity more broadly rounded than posterior. Valves covered with long hairs. Testes and spermatid tubes plainly visible through valves. Natatory setae of second antenna reach slightly beyond tips of terminal claws. Second thoracic leg with penultimate

segment distinctly divided; ultimate segment about as broad as long; terminal claw toothed along its distal third. Third thoracic leg with a short curved claw and reflexed seta. Ejaculatory duct with 15 whorls of spines. Length 0.68 mm, height 0.44 mm.

Female: Unknown.

*Occurrence*.—Eight males were collected from Phantom Lake in the Davis Mountains, Tex., on June 23, 1940, by Dr. Deevey. Male holotype, U. S. Nat. Mus. No. 96054.

*Cypridopsis musquizensis*, n. sp.

Figs. 39-41

*Specific characters*.—Female: Seen from the side, dorsal margin rounded; height about two-thirds the length; highest in the middle; a slight indentation or concavity in the anterior third; posterior third of dorsal margin rounds evenly into the broadly rounded posterior extremity. Ventral margin slightly sinuated in the middle. Anterior extremity considerably less broadly rounded than posterior. Surface of valves sparsely hairy; hairs short and coarse. Natatory setae of second antenna reach beyond tips of terminal claws. Second thoracic leg with penultimate segment distinctly divided; terminal claw long, slender, and smooth. Length 0.70 mm, height 0.44 mm.

Male: Similar in shape to female. Appendages similar. Male is somewhat smaller than female. Ejaculatory duct with 16 whorls of spines. Length 0.62 mm, height 0.41 mm.

*Occurrence*.—Seven females were taken from Phantom Lake in the Davis Mountains on June 23, 1940, by Dr. Deevey. Eight specimens, both male and female, were collected by Dr. Deevey from Toya Lake, Pecos County, Tex., on June 23, 1940, and from Musquiz Creek in the Davis Mountains, Tex., on June 19, 1940. Female holotype, U. S. Nat. Mus. No. 96055; male paratype, U. S. Nat. Mus. No. 96056.

*Cypridopsis toyensis*, n. sp.

Figs. 42-44

*Specific characters*.—Female: Seen from the side, elongated, height about three-fifths the length; highest slightly anterior to the middle. Dorsal margin rounded in anterior extremity and sloping from the middle posteriorly. Ventral margin almost straight. Anterior extremity more broadly rounded than posterior. Eye prominent. Surface of valves sparsely hairy. Color reddish

brown. Natatory setae of second antenna do not quite reach tips of terminal claws. Second thoracic leg with penultimate segment distinctly divided; ultimate segment broader than long; terminal claw heavily built and smooth; heavy bristles along inner border of last three segments with enlarged terminal portions, similar to the sense club of the second antenna. Length 0.61 mm, height 0.34 mm.

Male: Unknown.

*Occurrence*: Three females were taken at Phantom Lake, in the Davis Mountains, Tex., on June 23, 1940, by Dr. Deevey. One female was also collected from Toya Lake, Pecos County, Tex., on June 23, 1940, by Dr. Deevey. Female holotype, U. S. Nat. Mus. No. 96057.

*Cypridopsis potamis*, n. sp.

Figs. 45-47

*Specific characters*.—Female: Seen from the side, of a shape similar to that of *C. vidua*. Dorsal margin boldly arched, highest in the middle, height about two-thirds length. Ventral margin sinuated in the middle. Posterior extremity somewhat more broadly rounded than the anterior. Eye prominent. Valves with short, curved hairs. Natatory setae of second antenna reach considerably beyond tips of terminal claws. Second thoracic leg with penultimate segment distinctly divided; ultimate segment broader than long; terminal claw heavily developed and comparatively short. Third thoracic leg with large, curved, terminal claw and well-developed reflexed seta; bristles on margin of penultimate segment strongly developed. Length 0.60 mm, height 0.40 mm.

Male: Unknown.

*Occurrence*: One female was found in a collection made by Dr. Deevey in the San Jacinto River bottom near Harris City, Tex., on May 22, 1940. Female holotype, U. S. Nat. Mus. No. 96058.

Genus *Potamocypris* Brady, 1870

Shells very hairy, laterally compressed; right valve usually higher than left. Natatory setae generally extend to tips of terminal claws or beyond. Maxillary palp broadened distally. Furca rudimentary, with short base and flagellum.

*Potamocypris smaragdina* (Vavra, 1891)

Fig. 21

*Cypridopsis smaragdina* W. Vavra, Arch. Landesdf. Bohmen. 8 (3): 80. 1891.

*Potamocypris smaragdina* E. v. Daday, Ostr. Hungar.: 193. 1900.

*Potamocypris smaragdina* R. W. Sharpe, Ostracoda in Ward and Whipple: 808. 1918.

*Potamocypris smaragdina* C. C. Hoff, Illinois Biol. Monogr. 19 (1-2): 154. 1942.

*Specific characters.*—Female: Seen from the side, of triangular appearance, with well rounded dorsal margin; highest point anterior to the middle. Anterior end broadly rounded; posterior end more narrowly produced. Ventral margin slightly sinuated. Right valve larger than left and extending above it dorsally. Hyaline flange on left valve extends beyond right valve anteriorly and posteriorly. Seen from above, posterior end is more bluntly pointed than the anterior; greatest width less than half the length. Surface of valves pitted and very hairy, the hairs being stout and spine-like. Color light green or light yellowish-green. Natatory setae of second antenna extend beyond tips of terminal claws by one-third their own length. Furcal ramus with narrow base tapering into the flagellum; flagellum three times longer than the base; dorsal seta present. Length 0.62–0.68 mm, height 0.36–0.39 mm, width 0.32 mm.

Male: Shell of male more elongate, less high in proportion; ventral margin conspicuously sinuated. Size of males smaller but otherwise similar to females. Testes form prominent whorl in anterior part of the shell.

*Remarks.*—This species is very variable in size, shape, and color. It is commonly found in permanent waters such as lakes and streams and does not usually appear until May when temporary waters have normally dried up.

*Occurrence.*—Two females were collected from a Salt Flat ditch in Hudspeth County, Tex., on June 12, 1940, and three females from a tank, Salt Basin, Hudspeth County, Tex., on June 10, 1940.

*Distribution.*—In North America this species has been reported from Ohio, Illinois, Missouri, Tennessee, Washington, Louisiana, and Mexico. It is known in Europe in Bohemia and Switzerland.

Family Cytheridae: Subfamily  
Limnocytherinae

Genus *Limnocythere* Brady, 1867

Shells delicately built, thin and composed of horny material; surface of valves smooth or reticulated, either with or without furrows,

spines or tubercles. Exopodite of second antenna often biarticulate. Thoracic legs slender and similar. Furca with single terminal claw. A few species are found in brackish waters as well as in fresh.

*Limnocythere sancti-patrici* Brady and  
Robertson 1869

Fig. 48

*Limnocythere sancti-patrici* G. S. Brady and D. Robertson, Ann. Mag. Nat. Hist. (4) 3: 369. 1869.

*Limnocythere sancti-patrici* G. W. Müller, Das Tierreich, 31: 332. 1912.

*Specific characters.*—Female: Seen from the side, oblong in shape with only a slightly greater height in front than posteriorly; height about half the length. Dorsal margin slightly concave; ventral margin deeply sinuated. Seen from above, broadly ovate in outline with a slight constriction in the middle. Anterior to the constriction is an obtuse prominence; greatest width slightly less than the height. Valves, thin and pellucid with smooth edges but faintly reticulated in other regions. Scattered hairs at both ends. Color light yellowish brown. Anterior antennae with three setae at the tip, the innermost being bifurcate. Posterior antennae with slender terminal claws. Caudal ramus directed downward; terminal bristle hardly longer than the lateral bristle. Length 0.79 mm.

Male: Somewhat larger than the female with a more elongated shell and more deeply sinuated ventral margin. Posterior end somewhat enlarged. Length 0.82 mm.

*Remarks.*—This rather large member of the genus *Limnocythere* is easily recognized by its size alone. As has been pointed out clearly by Hoff (1942), the correct spelling of the genus is with an "o" rather than with an "i", and this decision has been followed in the present report.

*Occurrence.*—One female and one male were found in collections made from a pool near Saratoga, Polk County, Tex., on May 11, 1940.

*Distribution.*—In North America this species has been reported only from lakes in Michigan, heretofore. It has been found in Norway, Sweden, the British Isles, Bohemia, Hungary, and Switzerland.

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ENTOMOLOGY.—*The ant larvae of the myrmicine tribes Cataulacini and Cephalotini*. GEORGE C. WHEELER and JEANETTE WHEELER, University of North Dakota. (Communicated by C. F. W. Muesebeck.)

The tribe Cataulacini consists of a single genus (*Cataulacus*), which comprises about 45 species and occurs in the Ethiopian, Malagasy, Indomalayan, and Papuan Regions, with the greatest number of species in the Ethiopian. "All the species of this genus are tree-ants, usually forming medium-sized nests in hollow twigs and stems, or more rarely under the bark. They are timid and slow-moving insects, often feigning death or dropping rapidly to the ground when disturbed." (Arnold *vide* Wheeler, 1922, p. 198.)

The Neotropical tribe Cephalotini comprises about 90 species in four genera: *Procryptocerus*, *Zacryptocerus*, *Cephalotes*, and *Paracryptocerus*. The last-named is the largest with 60 species, three of which range into the southern Nearctic in Arizona, Texas, and Florida.

The ants of these two tribes are particularly interesting because of convergence. Although they inhabit different hemispheres, they occupy similar niches, i.e., they are ecological equivalents. Both are arboreal and live in cavities in plants. "Similarity in habits has gradually resulted in a remarkable resemblance in the shape of the head and the flattened body, . . . though they are not closely related to each other" (Wheeler, 1922, p. 496).

The larvae are likewise convergent in body shape and in pilosity. The body is elongate, straight (or nearly so), and subcylindrical or subellipsoidal; hairs are mostly minute or short. Both of these characters are possibly adaptations to life in plant cavities, particularly tubular cavities of small bore. A

long larva parked parallel and close to the wall would be less of a traffic hazard than a shorter larva parked crosswise or obliquely. These same characters are to be found also in the larvae of other ants which inhabit plant cavities, notably *Azteca*, *Camponotus*, *Crematogaster*, *Leptothorax*, and the Pseudomyrmecinae. *Camponotus* larvae have a neck, but it is short, stout, and strongly curled ventrally so that the cylindricality of the profile as a whole is scarcely affected. *Leptothorax* is somewhat stouter than the others; perhaps it is only in the early stages of adaptation.

The only noteworthy larval difference between these two tribes is to be found in the dorsal uncinata hairs: those of the Cataulacini have a single stout hook at the tip; in the Cephalotini they are anchor-tipped, i.e., with two stout hooks.

One-hooked dorsal hairs occur in *Azteca* and the Pseudomyrmecinae as well as in the Cataulacini. Anchor-tipped dorsal hairs occur in *Crematogaster* and *Leptothorax* as well as in the Cephalotini, but they are also to be found in many myrmicine genera which do not inhabit plant cavities.

#### Tribe CATAULACINI Emery

Elongate and subellipsoidal; nearly straight; prothorax forming a very short stout neck, which is inclined ventrally to about 45°. Spiracles minute, decreasing slightly in diameter toward the posterior end. Body hairs mostly very short; single-hooked (i.e., not anchor-tipped) hairs on the dorsum. Head moderately large; clypeus bulging. Antennae minute. Head hairs minute to very short. Anterior surface of labrum with